

REMARKS/ARGUMENTS

Favorable reconsideration of this application as currently amended and in view of the following remarks is respectfully requested.

Claims 1-10 are currently active in this case. Claims 1, 5, and 6 have been amended, and claims 9 and 10 have been added by the current amendment. No new matter has been added.

In the outstanding office action, claims 1-8 were rejected under 35 USC 112, second paragraph, as being indefinite; claims 1, 3-5, 7, and 8 were rejected under 35 USC 103(a) as being unpatentable over U.S. patent No. 3,981,584 to Guymer in view of U.S. patent No. 5,408,306 to Anderson and U.S. patent No. 4,448,887 to Kauffman; and claims 2 and 6 were rejected under 35 USC 103(a) as being unpatentable over Guymer in view of Anderson, Kauffman, and "Applicants' admitted prior art."

In response to the 35 USC 112, second paragraph, rejection, Applicants traverse the assertion that the preamble of claim 1 is indefinite. Applicants respectfully submit that the preamble is broad. However, the scope does not render the preamble indefinite. Consequently, the preamble of claim 1 has not been amended.

However, Applicants have amended claim 1 to clarify that a metal particle larger than a predetermined size is separated from the lubricated oil. The specification teaches on page 3, by way of non-limiting example, that a particle larger than 10.00 μm is removed from the oil. Regarding claims 5 and 6, Applicants have amended those claims as recommended in the office action. Consequently, no further rejection under 35 USC 112, second paragraph, is anticipated.

Briefly recapitulating, the present invention (claim 1) is directed to a method of diagnosing a lubricant. To that end, claim 1 recites filtrating a lubricating oil picked up from the lubricated portion so as to separate a metal particle larger than a predetermined size;

thereafter (1) measuring a metal concentration of a solution formed by dissolving the separated metal particle by an acid in accordance with an emission spectrometry and (2) measuring a metal concentration of a filtrate in accordance with the emission spectrometry; and diagnosing a state of the lubricated portion on the basis of the respective metal concentrations of the solution and the filtrate.

As a consequence of the above-described process, a metal concentration in a lubricating oil, for example, can be precisely measured and a state of the lubricated portion can be precisely diagnosed on the basis of a value of the measured concentrations.

In contrast thereto, neither Kauffman, Guymer, nor Anderson singly or in combination describes or suggests the combination of steps described above. The official action concedes that Guymer fails to teach or suggest the step of diagnosing a state of the lubricated portion on the basis of the respective metal concentrations of the solution and the filtrate. Applicants agree. However, the official action asserts that the Anderson "method detects and quantifies both small metal particle contaminants and large metal particle contaminants," that Kauffman teaches dissolving both small and large metal contaminants to allow for a spectrometry analysis, and that it would have been obvious to modify Guymer's disclosed method accordingly. Applicants respectfully traverse.

Applicants respectfully submit that both Anderson and Kauffman fail to teach or suggest analyzing dissolved separated larger metal particles. Anderson teaches evaluating separated larger metal particles (un-dissolved) and evaluating dissolved fine (i.e., small) particles (col. 3, lines 1-6), but does not teach dissolving the larger metal particles prior to the spectrometric analysis. Thus, Anderson recognized the benefits of dissolving the fine particles, but did not recognize the benefits of dissolving the larger particles. Kauffman dissolves all metal particles in the sample including small and large particles (i.e., there is no filtration or separation of the small and large particles). Thus, in Kauffman, because the large

metal particles are not separated from the smaller metal particles, the sensitivity of the measurement is reduced relative to the method of Applicants' invention.

Because neither Anderson nor Kauffman recognized the benefits of separating the larger particles from the smaller particles, and dissolving the larger particles as part of a separate analysis, Applicants respectfully submit that the 35 USC 103(a) rejection is based on impermissible hindsight and should be withdrawn.

Regarding new added claims 9 and 10, those claims define that the timing before the wear depth reaches the predetermined surface roughness of the lubricated portion is forecast on the basis of the rate of change of the wear depth. Consequently, highly precise control of the wear depth can be carried out, and the lubricated portion can be precisely diagnosed by predicting the timing of overhaul and parts replacement.

In contrast thereto, Kauffman, Guymer, and Anderson fail to teach this feature. Consequently, the applied art is not believed to anticipate or render obvious the subject matter recited by claims 9 and 10 when that art is considered singly or in combination.

In view of the foregoing, no further issues are believed to remain. An early and favorable action is respectfully requested.

Respectfully submitted,

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